

3/ heating the layer at a temperature near the sintering temperature in solid phase of said powder or said mixture of powders;

4/ bringing the heated layer to the solid phase sintering temperature to create grain joints between particles of said powder or said mixture of powders by sweeping with a laser beam said layer such that a selected portion of the powder, which corresponds to one of the digitized sections of the object to be produced, is sintered in solid phase by the supplemental energy supplied by the laser; and

repeating steps 2 to 4 while maintaining said heating until all the digitized superposed sections of the object to be produced are obtained.-

Amend claim 17 as follows:

--17. (amended) A process for the rapid prototyping by sintering in solid phase, with a laser, of a powder or a mixture of powders, comprising the steps of:

1/ obtaining a series of digitized superposed sections of an object to be produced, from a three-dimensional representation of said object;

2/ spreading the powder or mixture of powders in the form of a thin layer;

3/ heating the layer to a temperature near the sintering temperature in solid phase of said powder or said mixture of powders;

4/ compacting said layer thereby increasing the density of said layer and decreasing porosity of said powder or said mixture of powders;

5/ bringing the layer densified and heated to the sintering temperature by sweeping with a laser beam said layer such that a selected portion of the powder, which corresponds to one of the digitized sections of the object to be produced, is sintered in solid phase by the supplemental energy supplied by the laser; and

repeating steps 2 to 5 until all the digitized superposed sections of the object to be produced are obtained.--

Add the following new claims:

--22. (new) A process for the rapid prototyping by sintering in solid phase, with a laser, of a powder or a mixture of powders, comprising the steps of:

1/ obtaining a series of digitized superposed sections of an object to be produced, from a three-dimensional representation of said object;

2/ heating a working area comprising a target area at a temperature near the solid phase sintering temperature of the powder or mixture of powders;

3/ spreading the powder or mixture of powders in the form of a thin layer on said target area;

4/ bringing the heated layer to the solid phase sintering temperature by sweeping with a laser beam said layer such that a selected portion of the powder, which corresponds to one of the digitized sections of the object to be produced, is sintered in solid phase by the supplemental energy supplied by the laser; and

repeating steps 3 and 4 while maintaining said heating until all the digitized superposed sections of the object to be produced are obtained.

--23. (new) The process according to claim 22, wherein the powder or mixture of powders consists of ceramic material.

--24. (new) The process according to claim 22, wherein the powder or mixture of powders is heated and held at a temperature of the order of 300°C to 900°C.

--25. (new) The process according to claim 22, wherein the laser comprises a pulsed YAG laser having a wavelength of emitted radiation near infrared.

--26. (new) The process according to claim 22, comprising further a step of increasing the density of said layer prior to said sweeping with said laser.

--27. (new) The process according to claim 26, wherein the density of the layer is increased by being mechanically compacted.

--28. (new) The process according to claim 22, wherein said sintering temperature is kept below a fusion temperature of said powder.

--29. (new) The process according to claim 22, wherein said sintering in solid phase provides grain joints between particles of said powder.

--30. (new) The process according to claim 22, wherein said sintering in solid phase creates diffusion and plastic flow between particles of said powder without fusing said particles.--

REMARKS

The application has been amended so as to place it in condition for allowance at the time of the next Official Action.

Claims 13-30 are present in the application.

Claims 13 and 17 have been amended.